Human Anatomy: Neuroanatomy

Code: 106729
ECTS Credits: 4

2024/2025

Degree	Type	Year
2502442 Medicine	FB	2

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Teachers

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

It is recommended that the student had acquired the basic knowledge and skills from the subjects of Human Anatomy taught in the first year of the degree of Medicine, as well as the basic competences for self-learning and group work.

Objectives and Contextualisation

The Human Anatomy course: Neuroanatomy is a subject taught in the 2nd semester of the 2nd year of the Degree in Medicine and is focused on the nervous system.
The objectives of the subject are that students:
• Study the organization of the nervous system.
• Study of the anatomical structures of the central nervous system and the autonomic nervous system.
• Learn and use correctly the anatomical nomenclature related to the nervous system
• Know and identify the different anatomical structures that integrate the nervous system
• Apply acquired knowledge of embryology and anatomy to the pathogenesis and symptomatology of congenital and / or acquired pathologies.
• Get practical skills

Competences

- Convey knowledge and techniques to professionals working in other fields.
- Critically assess and use clinical and biomedical information sources to obtain, organise, interpret and present information on science and health.
- Demonstrate a sufficient command of English, both oral and written, for effective scientific and professional communication.
- Demonstrate basic research skills.
- Demonstrate knowledge and understanding of descriptive and functional anatomy, both macro- and microscopic, of different body systems, and topographic anatomy, its correlation with basic complementary examinations and its developmental mechanisms.
- Demonstrate understanding of the basic sciences and the principles underpinning them.
- Demonstrate understanding of the causal agents and the risk factors that determine states of health and the progression of illnesses.
- Demonstrate understanding of the structure and function of the body systems of the normal human organism at different stages in life and in both sexes.
- Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
- Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.

Learning Outcomes

1. Apply knowledge of anatomy to the production of structured review texts.
2. Convey knowledge and techniques to professionals working in other fields.
3. Demonstrate a sufficient command of English, both oral and written, for effective scientific and professional communication.
4. Demonstrate basic research skills.
5. Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
6. Describe anatomical structures, organisation and morphogenesis of the cardiovascular system, central nervous system and the sense organs.
7. Describe the factors that determine the form, general aspect and proportions of the human body in health at different stages in life and in both sexes.
8. Describe the fundamental scientific principles of human anatomy.
9. Describe the general anatomical organisation of the systems of the human body in health.
10. Explain the formation of the embryonic disc and its principal derivatives.
11. Identify the anatomical structures that constitute the different body systems in good health in the major stages of the life cycle and in both sexes.
12. Identify the anatomical structures that make up the cardiovascular system, the central nervous system, and the sense organs in health, by using inspection, palpation and/or macroscopic methods and different diagnostic imaging techniques.
13. Identify the main techniques used in a human anatomy laboratory.
14. Identify the morphogenetic mechanisms of the main alterations in the development of the cardiovascular system, the central nervous system and the sense organs.
15. Know and make correct use of the international anatomical nomenclature.
16. Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.

Content

Unit 1 - Introduction to the nervous system: Basic terminology. Organization of the nervous system. Main components of the nervous system (neurons- neuroglia, afferent-efferent neurons, white-gray substance, nuclei-tracts).

Unit 2 - Telencephalon: external morphology of the cerebral hemispheres (lobes, sulcus, gyrus, functional areas of the cerebral cortex). Core nuclei. White telencephalic substance (association, commissural and projection fibres). Limbic system

Unit 3 - Diencephalon: Generalities. Thalamus. Hypothalamus. Epithalamus. Subthalamus. Pituitary gland

Unit 4 - Brainstem: Generalities. Reticular system, Midbrain, Pons and Bulb (external morphology, internal morphology, transverse images, clinical significance).

Unit 5 - Cerebellum: Generalities. External and internal morphology. Connections

Unit 6 - Spinal cord: Generalities. External and internal morphology, ascending and descending tracts. Clinical considerations

Unit 7 - Meninges: Generalities. Brain and spinal meninges.

Unit 8 - Cerebrospinal fluid and ventricular system.

Unit 9 - Vascularization of the central nervous system: Arterial and venous vascularization.

Unit 10- Autonomic or vegetative nervous system: Generalities. Sympathetic and Parasympathetic nervous system.

Unit 11 - Cranial nerves: Generalities. Sensory nerves (n.I-olfactory, n.II-optic, n.III-vestibulocochlear). Oculomotors Nerves (n.III-oculomotor, n.IV-trochlear, n.VI-abducens). Trigeminal nerve (n.V). Facial nerve (n.VII). Other nerves (n.IX- glossopharyngeal nerve, n.X-vagus nerve, n.XI-accessory nerve, n.XII- hypoglossal nerve).

Lectures: 25 hours.
Practical Lab in the dissection room: 4 (2 hours each).
Seminar of clinical anatomy: 1 (1,5 hours).

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practical Labs	8	0.32	1, 15, 3, 4, 5, 7, 2, 12, 11, 13, 16
Seminars	1.5	0.06	1, 15, 3, 4, 5, 9, 6, 2, 14, 12, 11, 13, 16
Theory	25	1	1, 15, 8, 9, 6, 10, 12, 11, 13
Type: Supervised			
Tutorships	18	0.72	1, 3, 4, 5, 7, 2, 10, 16
Type: Autonomous			
Autonomous activities-personal study. Reading of articles. Preparation of summaries	44	1.76	1, 15, 3, 4, 5, 8, 9, 6, 2, 10, 12, 11, 13, 16

In accordance with the objectives of the subject, the teaching methodology of the course is based on the following activities:

DIRECTED ACTIVITIES

Lectures (25 hours): Systematic exhibition of the subject, giving relevance to the most important concepts. The student acquires basic knowledge of the subject attending master classes and complementing them with personal study of the topics explained.

Seminars (1.5 hours): Sessions with a smaller number of students for the discussion and resolution of exercises. Students apply the knowledge acquired to solve clinical cases.

Practical Labs (8 hours): The students attend in small groups to the dissection room to study the different contents of the subject. Students identify different anatomical structures in dissections, prossections and imaging diagnostic techniques (radiology, computed tomography, magnetic resonance, arteriography, etc.). The objective is to consolidate the knowledge acquired in lectures, tutorials and the autonomous activities.

SUPERVISED ACTIVITIES

Tutorials: The tutorials will be made in a personalized way in the teacher's office (hours to be arranged) or by email. The aim of the tutorials is to clarify concepts, establish the knowledge acquired and facilitate the study by the students. They can also be used to solve doubts that the students have about the preparation of the seminars.

AUTONOMOUS ACTIVITIES
Comprehensive reading of texts and articles. Personal study, schemes and summaries preparation. Conceptual assimilation of the contents of the subject. Book chapters and recommended articles will be part of the evaluation.

"N.B. The proposed teaching and assessment methodologies may experience some modifications as a result of the restrictions on face-to-face learning imposed by the health authorities. The teaching staff will use the Moodle classroom or the usual communication channel to specify whether the different directed and assessment activities are to be carried out on site or online, as instructed by the Faculty".

Learning activities

Type: Directed
Practical Labs (PLAB)
Seminars (SEM)
Lectures-Theoretical classes (TE)

Type: Supervised
Tutorials

Type: Autonomous
Autonomous activities- personal study
Reading of articles
Preparation of summaries

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
A) First midterm exam: multiple choice test	48%	1.45	0.06	1, 15, 3, 4, 5, 7, 8, 9, 6, 10, 14, 12, 11, 13, 16
B) Second midterm exam: no multiple choice exam	48%	1.45	0.06	1, 15, 3, 4, 5, 7, 6, 2, 10, 14, 12, 11, 13
D) Continuous evaluation	4%	0.6	0.02	1, 15, 4, 5, 7, 8, 9, 6, 16

NOTE: *This subject does not provide for a single assessment*

RETAKING STUDENTS:

No grade from one year is saved to another. The subject does not differentiate between retaking students and regular students. If a practical or seminar coincides with a teaching activity from another subject, according to the regulations of the Faculty of Medicine, the higher course subject must change the day of the practical or seminar so that the student can attend all the teaching activities of the enrolled subjects. It is not the lower course subject that needs to adjust its schedule.

MIDTERMS EXAMS:

This subject will schedule 2 midterms, each accounting for 48% of the final grade of the subject. It is not necessary to attend the midterms to be able to take the recovery exam

- 1st mid-term: will cover the contents (TE, PLAB, SEM). It will consist of multiple-choice questions with only 1 corrected answer
- 2n mid-term: will cover the contents (TE, PLAB, SEM). It will consist of short answer questions based on prossections and/or anatomical images, relation questions, theme development, true and false questions, etc.. In the campus' Moodle, the number of questions and characteristics of the same will be specified.

Students must achieve a minimum grade of 5.00 to pass the material and not to have the retake exam.

CONTINUOUS EVALUATION:

Continuous assessment represents 4% of the subject's grade. At the end of each PLAB, students will have to answer questions based on the identification of anatomical structures. The grade for this continuous assessment will be the sum of all the assessments performed in each PLAB throughout the semester. This grade will be given at the end of the course, after the retake exam has been taken.

RETAKE EXAM:

Recovery of the continous evaluation can not be done in the retake exam, only midterm exams (grade < 5,00) can be done in the retake exam. The students that have achieved a grade $\geq$ 5.00 in the midterm's exams are not obligated to participate in the retake exam. All students enrolled in the subject can take this assessment, even if they have not attended any scheduled teaching activity for the subject during the semester.

Students must take the retake exam if:

- They have not passed material in 1 or both midterms (only the midterm with a grade <5.00 will need to be retaken.
- They have not attended a midterm exam (only the unattended midterm will need to be taken).
- They have passed material but want to improve their grade. In these cases: a) Notify the subject coordinator (by email) at least 1 week before the recovery exam. b) Even if the student taking the recovery exam to improve the grade has already passed the subject, they must mandatorily achieve a minimum grade of 5.0 on this exam. Otherwise, they will have failed the subject and c) Once the student achieves a minimum grade of 5.0 on the recovery exam, the final grade of the subject will be calculated by choosing the highest score obtained in each part between the midterm and the retake exam.

Retake exam: will have the same characteristics as the midterm exams. In the campus' Moodle, the number of questions, characteristics of the same, and percentage of each part will be specified. Students who need to recover both midterms will retake the 1st midterm (Test exam) and the 2nd midterm (no test exam). They will thus have a recovery grade for the 1st midterm and another recovery grade for the 2nd midterm.

FINAL GRADE OF THE SUBJECT:

To pass the subject, students must achieve a minimumgrade of 5.0 in EACH midterm exam (minimum grade of 5.0 in the first midterm and minimum grade of 5.0 in the second midterm).

Subject grade = 1st midterm grade (48%) + 2nd midterm grade (48%) + Continuous evaluation grade (4%).

To pass the subject, students:

- must achieve a minimum grade of 5.0 in each midterm. In the case that a student obtains a good grade in one midterm but a grade below 5.0 in the other, the student's grade will be a maximum of 4.8 points, even if the weighted calculation of the subject's grade is equal to or higher than 5.0.
- must achieve a minimum grade of 5.0 in total

The final grade of the subject will have a numeric expression with one decimal on a scale of 0 to 10 and a qualitative equivalence according to the UAB criteria, from fail (0-4.9), pass (5.0-6.9), notable (7.0-8.9), and outstanding (9.0-10.0). Rounding to the nearest whole number will occur when the grade is within a tenth of a value that involves a qualitative change in grading. An honour's enrolment will be awarded among students who have achieved an excellent rating. The number of enrolments awarded cannot exceed 5% of the students enrolled, as established by the academic regulations of the UAB. A student is considered non-evaluable who has NOT attended any assessment (neither partial nor final).

ANNOUNCEMENTS, REVISIONS:
Exams (day, hour, classroom ...) and revision of the marks will be announced through the UAB moodle. The procedure for reviewing marks will be in accordance with the current regulations of the UAB and in any case be individually.

Bibliography

Textbook

- Crossman AR, Neary D. (2019). Neuroanatomía . Texto y atlas en color. Elsevier Ed. Format E-book a la Biblioteca de la UAB
- Garcia-Porrero JA, Hurlé JM (2020). Anatomia Humana. 2ª edición Ed. McGraw-Hill Interamericana. Format E-book a la Biblioteca de la UAB
- Snell. Neuroanatomía clínica. (2019). 8ª edición. Ed. Lippincott Williams & Wilkins Format E-book a la Biblioteca de la UAB

Atles of Anatomy

- Gilroy AM et al. PROMETHEUS Atlas de Anatomía (2021). 4ª ed. Ed. Panamericana: Buenos Aires. Format E-book a la Biblioteca de la UAB
- Rohen JW, Yokochi C, Lütjen-Drecoll E (2021). Atlas de Anatomía Humana. 9ª ed. Ed. Elsevier Science, Madrid Format E-book a la Biblioteca de la UAB

Web

- Videos de disección: https://www.youtube.com/channel/UCjAj3ylS_wAsWZZOdR2koNQ

Software

No specific sowfware is needed

Language list

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	101	Catalan	second semester	afternoon
(PLAB) Practical laboratories	102	Catalan	second semester	afternoon
(PLAB) Practical laboratories	103	Catalan	second semester	afternoon
(PLAB) Practical laboratories	104	Catalan	second semester	afternoon
(PLAB) Practical laboratories	105	Catalan	second semester	afternoon
(PLAB) Practical laboratories	106	Catalan	second semester	afternoon
(PLAB) Practical laboratories	107	Catalan	second semester	afternoon
(PLAB) Practical laboratories	108	Catalan	second semester	afternoon
(PLAB) Practical laboratories	109	Catalan	second semester	afternoon
(PLAB) Practical laboratories	110	Catalan	second semester	afternoon
(PLAB) Practical laboratories	111	Catalan	second semester	afternoon
(PLAB) Practical laboratories	112	Catalan	second semester	afternoon
(PLAB) Practical laboratories	113	Catalan	second semester	afternoon
(PLAB) Practical laboratories	114	Catalan	second semester	afternoon
(PLAB) Practical laboratories	115	Catalan	second semester	afternoon
(PLAB) Practical laboratories	116	Catalan	second semester	afternoon
(PLAB) Practical laboratories	117	Catalan	second semester	afternoon
(PLAB) Practical laboratories	118	Catalan	second semester	afternoon
(PLAB) Practical laboratories	119	Catalan	second semester	morning-mixed

(PLAB) Practical laboratories	120	Catalan	second semester	morning-mixed
(SEM) Seminars	101	Catalan	second semester	afternoon
(SEM) Seminars	102	Catalan	second semester	afternoon
(SEM) Seminars	103	Catalan	second semester	afternoon
(SEM) Seminars	104	Catalan	second semester	afternoon
(SEM) Seminars	105	Catalan	second semester	afternoon
(SEM) Seminars	106	Catalan	second semester	afternoon
(SEM) Seminars	107	Catalan	second semester	afternoon
(SEM) Seminars	108	Catalan	second semester	afternoon
(SEM) Seminars	109	Catalan	second semester	afternoon
(SEM) Seminars	110	Catalan	second semester	afternoon
(SEM) Seminars	111	Catalan	second semester	afternoon
(SEM) Seminars	112	Catalan	second semester	afternoon
(SEM) Seminars	113	Catalan	second semester	afternoon
(SEM) Seminars	114	Catalan	second semester	afternoon
(SEM) Seminars	115	Catalan	second semester	afternoon
(SEM) Seminars	116	Catalan	second semester	afternoon
(SEM) Seminars	117	Catalan	second semester	afternoon
(SEM) Seminars	118	Catalan	second semester	afternoon
(SEM) Seminars	119	Catalan	second semester	afternoon
(SEM) Seminars	120	Catalan	second semester	morning-mixed
(TE) Theory	101	Catalan	second semester	morning-mixed
(TE) Theory	102	Catalan	second semester	morning-mixed
(TE) Theory	103	Catalan	second semester	morning-mixed